SEQUENCE LISTING

<110> YUAN, Chong-Sheng

<120> DETERMINATION OF IONS USING
ION-SENSITIVE ENZYMES

<130> 466992001100

<140> US 10/665,883
<141> 2003-09-19

<160> 18

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> 40%-100% identity to leader sequence

<400> 1
Met Gly Gly Ser Gly Asp Asp Asp Asp Leu Ala Leu
1 5 10

<210> 2
<211> 356
<212> PRT
<213> Artificial Sequence

<220>
<223> 40%-100% identity to the biphosphate nucleotidase

<400> 2
Ala Leu Glu Arg Glu Leu Leu Val Ala Thr Gln Ala Val Arg Lys Ala
1 5 10 15
Ser Leu Leu Thr Lys Arg Ile Gln Ser Glu Val Ile Ser His Lys Asp
20 25 30
Ser Thr Thr Ile Thr Lys Asn Asp Asn Ser Pro Val Thr Thr Gly Asp
35 40 45
Tyr Ala Ala Gln Thr Ile Ile Ile Asn Ala Ile Lys Ser Asn Phe Pro
50 55 60
Asp Asp Lys Val Val Gly Glu Glu Ser Ser Ser Gly Leu Ser Asp Ala
65 70 75 80
Phe Val Ser Gly Ile Leu Asn Glu Ile Lys Ala Asn Asp Glu Val Tyr
85 90 95
Asn Lys Asn Tyr Lys Lys Asp Asp Phe Leu Phe Thr Asn Asp Gln Phe
100 105 110
Pro Leu Lys Ser Leu Glu Asp Val Arg Gln Ile Ile Asp Phe Gly Asn
115 120 125
Tyr Glu Gly Gly Arg Lys Gly Arg Phe Trp Cys Leu Asp Pro Ile Asp
130 135 140
Gly Thr Lys Gly Phe Leu Arg Gly Glu Gln Phe Ala Val Cys Leu Ala
145 150 155 160
Leu Ile Val Asp Gly Val Val Gln Leu Gly Cys Ile Gly Cys Pro Asn
165 170 175
Leu Val Leu Ser Ser Tyr Gly Ala Gln Asp Leu Lys Gly His Glu Ser
180 185 190
Phe Gly Tyr Ile Phe Arg Ala Val Arg Gly Leu Gly Ala Phe Tyr Ser

```
        195                 200                 205
Pro Ser Ser Asp Ala Glu Ser Trp Thr Lys Ile His Val Arg His Leu
    210                 215                 220
Lys Asp Thr Lys Asp Met Ile Thr Leu Glu Gly Val Glu Lys Gly His
225                 230                 235                 240
Ser Ser His Asp Glu Gln Thr Ala Ile Lys Asn Lys Leu Asn Ile Ser
                245                 250                 255
Lys Ser Leu His Leu Asp Ser Gln Ala Lys Tyr Cys Leu Leu Ala Leu
            260                 265                 270
Gly Leu Ala Asp Val Tyr Leu Arg Leu Pro Ile Lys Leu Ser Tyr Gln
        275                 280                 285
Glu Lys Ile Trp Asp His Ala Ala Gly Asn Val Ile Val His Glu Ala
    290                 295                 300
Gly Gly Ile His Thr Asp Ala Met Glu Asp Val Pro Leu Asp Phe Gly
305                 310                 315                 320
Asn Gly Arg Thr Leu Ala Thr Lys Gly Val Ile Ala Ser Ser Gly Pro
                325                 330                 335
Arg Glu Leu His Asp Leu Val Val Ser Thr Ser Cys Asp Val Ile Gln
            340                 345                 350
Ser Arg Asn Ala
        355
```

<210> 3
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> 40%-100% identity to the second bacterial leader sequence

<400> 3
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Lys Gly Glu Leu Glu Gly Leu Pro Ile Pro Asn Pro Leu Leu Arg Thr
 1               5                  10                  15
Gly
```

<210> 4
<211> 356
<212> PRT
<213> Artificial Sequence

<220>
<223> Chimeric protein

<400> 4
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Ala Leu Glu Arg Glu Leu Leu Val Ala Thr Gln Ala Val Arg Lys Ala
 1               5                  10                  15
Ser Leu Leu Thr Lys Arg Ile Gln Ser Glu Val Ile Ser His Lys Asp
            20                  25                  30
Ser Thr Thr Ile Thr Lys Asn Asp Asn Ser Pro Val Thr Thr Gly Asp
        35                  40                  45
Tyr Ala Ala Gln Thr Ile Ile Ile Asn Ala Ile Lys Ser Asn Phe Pro
    50                  55                  60
Asp Asp Lys Val Val Gly Glu Glu Ser Ser Ser Gly Leu Ser Asp Ala
65                  70                  75                  80
Phe Val Ser Gly Ile Leu Asn Glu Ile Lys Ala Asn Asp Glu Val Tyr
                85                  90                  95
Asn Lys Asn Tyr Lys Lys Asp Asp Phe Leu Phe Thr Asn Asp Gln Phe
            100                 105                 110
Pro Leu Lys Ser Leu Glu Asp Val Arg Gln Ile Ile Asp Phe Gly Asn
        115                 120                 125
```

```
Tyr Glu Gly Gly Arg Lys Gly Arg Phe Trp Cys Leu Asp Pro Ile Asp
    130                 135                 140
Gly Thr Lys Gly Phe Leu Arg Gly Glu Gln Phe Ala Val Cys Leu Ala
145                 150                 155                 160
Leu Ile Val Asp Gly Val Val Gln Leu Gly Cys Ile Gly Cys Pro Asn
                165                 170                 175
Leu Val Leu Ser Ser Tyr Gly Ala Gln Asp Leu Lys Gly His Glu Ser
            180                 185                 190
Phe Gly Tyr Ile Phe Arg Ala Val Arg Gly Leu Gly Ala Phe Tyr Ser
        195                 200                 205
Pro Ser Ser Asp Ala Glu Ser Trp Thr Lys Ile His Val Arg His Leu
    210                 215                 220
Lys Asp Thr Lys Asp Met Ile Thr Leu Glu Gly Val Glu Lys Gly His
225                 230                 235                 240
Ser Ser His Asp Glu Gln Thr Ala Ile Lys Asn Lys Leu Asn Ile Ser
                245                 250                 255
Lys Ser Leu His Leu Asp Ser Gln Ala Lys Tyr Cys Leu Leu Ala Leu
            260                 265                 270
Gly Leu Ala Asp Val Tyr Leu Arg Leu Pro Ile Lys Leu Ser Tyr Gln
        275                 280                 285
Glu Lys Ile Trp Asp His Ala Ala Gly Asn Val Ile Val His Glu Ala
    290                 295                 300
Gly Gly Ile His Thr Asp Ala Met Glu Asp Val Pro Leu Asp Phe Gly
305                 310                 315                 320
Asn Gly Arg Thr Leu Ala Thr Lys Gly Val Ile Ala Ser Ser Gly Pro
                325                 330                 335
Arg Glu Leu His Asp Leu Val Val Ser Thr Ser Cys Asp Val Ile Gln
            340                 345                 350
Ser Arg Asn Ala
        355
```

<210> 5
<211> 1176
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence encoding a chimeric protein

<400> 5
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tctcacaagg actccactac tattaccaag aatgataatt ctccagtaac cacaggtgat 180
tatgctgcac aaacgatcat cataaatgct atcaagagca attttcctga tgataaggta 240
gttggtgaag aatcctcatc aggattgagc gacgcattcg tctcaggaat tttaaacgaa 300
ataaaagcca atgacgaagt ttataacaag aattataaaa aggatgattt tctgtttaca 360
aacgatcagt ttccgctaaa atctttggag gacgtcaggc aaatcatcga tttcggcaat 420
tacgaaggtg gtagaaaagg aagattttgg tgtttggatc ctattgacgg aaccaagggg 480
tttttaagag gtgaacagtt tgcagtatgt ctggccttaa ttgtggacgg tgttgttcag 540
cttggttgta ttggatgccc caacttagtt ttaagttctt atggggccca agatttgaaa 600
ggccatgagt catttggtta tatctttcgt gctgttagag gtttaggtgc cttctattct 660
ccatcttcag atgcagagtc atggaccaaa atccacgtta gacacttaaa agacactaaa 720
gacatgatta ctttagaggg agttgaaaag ggacactcct ctcatgatga acaaactgct 780
atcaaaaaca aactaaatat atccaaatct ttgcacttgg attctcaagc caagtactgt 840
ttgttagcat tgggcttagc agacgtatat ttacgtctgc ctatcaaact ttcttaccaa 900
gaaaagatct gggaccatgc tgcaggcaac gttattgtcc atgaagctgg aggtatccat 960
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gatgtcattc agtcaagaaa cgccaagggc gagcttgaag gtttgcctat ccctaaccct 1140
ctcctccgta ccggtcatca tcaccatcac cattga                           1176
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<210> 6
<211> 7

<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary epitope tag

<400> 6
Asp Tyr Lys Asp Asp Asp Lys
 1   5

<210> 7
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary epitope tag

<400> 7
Tyr Pro Tyr Asp Val Pro Asp Tyr Ala
 1   5

<210> 8
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary epitope tag

<400> 8
Cys Gln Asp Leu Pro Gly Asn Asp Asn Ser Thr
 1   5   10

<210> 9
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary epitope tag

<400> 9
Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu
 1   5   10

<210> 10
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary epitope tag

<400> 10
His His His His His His
 1   5

<210> 11

<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary epitope tag

<400> 11
Asp Thr Tyr Arg Tyr Ile
 1   5

<210> 12
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary epitope tag

<400> 12
Glu Tyr Met Pro Met Glu
 1   5

<210> 13
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary epitope tag

<400> 13
Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg
 1   5   10

<210> 14
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary epitope tag

<400> 14
Ser Phe Pro Gln Phe Lys Pro Gln Glu Ile
 1   5   10

<210> 15
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary epitope tag

<400> 15
Lys Gly Phe Ser Tyr Phe Gly Glu Asp Leu Met Pro
 1   5   10

<210> 16
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary epitope tag

<400> 16
Gln Tyr Pro Ala Leu Thr
1 5

<210> 17
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary epitope tag

<400> 17
Gln Arg Gln Tyr Gly Asp Val Phe Lys Gly Asp
1 5 10

<210> 18
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Exemplary epitope tag

<400> 18
Glu Val His Thr Asn Gln Asp Pro Leu Asp
1 5 10